Decoder Synchronization For Deep Space Missions

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Abstract

1he Consul tative Committee for Space Data Standards (CCSDS) recommends that space communication links employ a concatenated error-correcting system where the inner code is a convolutional (7, 1/2) code and the outer code is a (255,223) Reed- Solomon cede. 7 he traditional implementation is to perform the node synchronization for the Viterbi decoder and the frame synchronization for the Reed-Solomon decoder as separate, sequential operations. 7his article discusses a unified synchronization technique that is required for Deep Space missions where both the dafa rate and the signal- to-noise ratios (SNRs) are extremely low. If combines frame synchronization in the bit and symbol domains and traditional me tric-growth techniques to es tablish a joint frame and node synchronization. A variation on this technique is used for the Galileo spacecraft on ifs Jupiter-bound mission.